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Running heading:

Leadership and Climate for EBP

Title:

Unit Leadership and Climates for Evidence-Based Practice Implementation
in Acute Care: A Cross-Sectional Descriptive Study

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Heading level 2:

Abstract

Purpose: The purposes of this study were to (a) describe nurse manager (NM) leadership behaviors for evidence-based practice, NM evidence-based practice competencies, and unit climates for evidence-based practice implementation in acute care, and (b) test for differences in NMs' and staff nurses' (RNs') perceptions.

Design: A multisite cross-sectional design was used to collect data from a sample of 24 NMs and 553 RNs from 24 adult medical-surgical units in seven U.S. community hospitals.

Methods: Responses were collected using electronic questionnaires, inclusive of the Nurse Manager Evidence-Based Practice Competency Scale (NM only), Implementation Leadership Scale, and Implementation Climate Scale. E-mail reminders and gift card lottery drawings encouraged response. Descriptive statistics described total and subscale scores by role. Differences in perceptions were evaluated using independent t-tests with Bonferroni correction (? = .05).

Findings: 23 NMs and 287 RNs responded (95.8% and 51.9% response rates, respectively). NMs reported they were "somewhat competent" in evidence-based practice (M = 1.62 [SD = 0.5]; 0–3 scale). NMs and RNs perceived leadership behaviors (NM: M = 2.73 [SD = 0.46]; RN: M = 2.88 [SD = 0.78]; 0–4 scale) and unit climates for evidence-based practice implementation (NM: M = 2.16 [SD = 0.67]; RN: M = 2.24 [SD = 0.74]; 0–4 scale) as evident to a "moderate extent." RN and NM perceptions differed significantly on the Proactive (p = .01) and Knowledgeable (p < .001)

leadership subscales.

Conclusions: Evidence-based practice competencies and leadership behaviors of NMs, and unit climates for evidence-based practice were modest at best and interventions are needed. To close the research to practice gap, future studies should investigate the interplay between social dynamic context factors and implementation strategies to promote uptake of evidence-based practices.

Clinical Relevance: Critical attention is needed to build organizational capacity for evidence-based practices through development of unit leadership and climate for evidence-based practice to accelerate routine use of evidence-based practices for improving care delivery and patient outcomes. The three instruments described herein provide a foundation for nurse leaders to assess these dynamic context factors and design interventions or programs where there is opportunity for improvement.

Body of article:

Context factors greatly influence the implementation and use of evidence-based practices (EBPs) and may help to explain why implementation strategies work in some settings but not in others (May, Johnson, Finch, 2016; Titler, 2010). Broadly defined, context is the setting or environment in which implementation takes place (Kitson & Harvey, 2016) and includes structural and social dynamic factors. Structural factors are physical or operational characteristics of the setting that enable or constrain implementation of EBP (e.g., staffing, unit size, types of patients; Damschroder et al., 2009). Social dynamic factors pertain to the roles, relationships, and dynamics of the individuals and groups within a practice setting and include unit leadership and climate (Damschroder et al., 2009; Kitson & Harvey, 2016). Although studies have identified structural factors that influence EBP in nursing units, very few studies have described social dynamic factors of unit leadership and climate for EBP implementation.

Nurse managers are optimally positioned to influence implementation

of EBPs (Birken et al., 2016; Gifford, Davies, Edwards, Griffin, & Lebanon, 2007; Sandström, Borglin, Nilsson, & Willman, 2011). Competencies in EBP (Shuman, Ploutz-Snyder, & Titler, 2018) and leadership behaviors supportive of EBP implementation (Aarons, Ehrhart, & Farahnak, 2014; Shuman, Liu, et al., 2018) may contribute to facilitating unit climates more favorable for EBP implementation, and ultimately to patient receipt of evidence-based care. However, the EBP competencies and leadership behaviors of nurse managers in acute care settings have not been well described.

Unit climate for EBP implementation is facilitated by the practices, policies, and procedures managers expect, support, and reward (Ehrhart, Aarons, & Farahnak, 2014; Schneider, Ehrhart, & Macey, 2013). Although many implementation frameworks include culture as an important component in implementation, climate is often overlooked. Schein (2017) defines organizational culture as a pattern of shared basic assumptions that an organization learns while solving problems and are taught to newcomers. Organizational climate refers to the "shared meaning organizational members attach to the events, policies, practices, and procedures they experience and the behaviors they see rewarded, supported, and expected" (Ehrhart, Schneider, & Macey, 2014, p. 2). Other studies have examined climates with a specified focus, such as safety climate and service climate (Ehrhart, Schneider, & Macey, 2014); however, very few studies have investigated implementation-focused climates, and no study has described these climates in acute care nursing units.

Heading level 1:

Conceptual Framework

The Promoting Action on Research Implementation in Health Services (PARIHS) framework informed the conceptual model developed for this study (Figure S1). The PARIHS model contends that evidence, facilitation, and context are key determinants of successful EBP implementation (Kitson, Harvey, & McCormack, 1998; Kitson et al., 2008). In the PARIHS framework, context includes leadership and climate, each bearing significant influence on implementation.

Social dynamic factors, which are of interest to this study,

include nurse manager EBP competency, nurse manager EBP leadership behaviors, and unit climate for EBP implementation. Nurse manager EBP competency is defined as a nurse manager's self-perceived performance regarding the integration of knowledge, skills, abilities, and judgment about EBP (Shuman, Ploutz-Snyder, et al., 2018). Nurse manager leadership behaviors for EBP implementation are activities and behaviors used by nurse managers to facilitate support EBP implementation efforts and create EBP climates on their units (Aarons, Ehrhart, & Farahnak, 2014; Shuman, Liu, et al., 2018). Unit climate for EBP implementation is defined as nursing staff's perceptions of the practices, policies, and procedures that are expected, rewarded, supported, and resourced regarding EBP use and implementation in the unit (Ehrhart, Aarons, & Farahnak, 2014).

Further understanding of leadership and climate for EBP implementation in acute care settings is needed and crucial for identifying and developing implementation strategies that address these factors. Therefore, the purposes of this article were to:

Bulleted List

- Describe nurse managers' self-perceptions of their EBP competencies in hospital settings.
- Describe nurse managers' EBP leadership behaviors in hospital settings as (a) self-perceived and (b) as perceived by staff nurses.
- Describe (a) staff nurses' and (b) nurse managers' perceptions of unit climates for EBP implementation in hospital settings.
- Test for differences among staff nurse and manager perceptions of EBP implementation leadership behaviors and unit climates for EBP implementation.

Heading level 1:

Methods

Heading level 2:

Design

A multisite cross-sectional design was used to address the aims.

The study was part of a larger study conducted in 2016–2017 (Shuman, 2017; Shuman, Liu, et al., 2018). Approvals from the ethics review board at the University of Michigan and at each participating hospital were obtained prior to data collection.

Heading level 2:

Setting

A convenience sample of seven community hospitals across the midwestern and northeastern United States were recruited through the National Nursing Practice Network. Twenty-four nursing units met the following inclusion criteria: (a) cared for adult patients ($\geq$21 years of age); (b) were designated as a medical, surgical, medical-surgical, or specialty unit (e.g., oncology, orthopedics, cardiac step-down unit); and (c) had an eligible nurse manager (described in the ensuing section). Mother-baby, pediatric, neonatal, psychiatric, and critical or intensive care units were excluded. For managers who supervised multiple eligible units, one of their units was randomly selected.

Heading level 2:

Sample

Heading level 3:

Nurse managers. Nurse managers were defined as registered nurses who oversaw unit-level operations and were responsible for patient care delivered by clinical staff. Inclusion criteria for nurse managers were: (a) licensed as a registered nurse; (b) had responsibility and accountability for unit-level operations; (c) was not serving in an interim role; and (d) was direct supervisor of nursing staff on the study unit. Senior nurse leaders holding executive positions that involved organizational and operational activities were excluded (such roles included chief nursing officer or department director). Twenty-four nurse managers were invited to participate.

Heading level 3:

Staff nurses. Staff nurses were licensed registered nurses who providing direct patient care on a study unit. Inclusion criteria for staff nurses were: (a) licensed as a registered nurse; (b) worked ?0.40 full-time equivalents (FTE); (c) provided direct patient care; and (d) was designated as staff on the study unit. Those designated as contingency or agency staff or floated among units were excluded. Thirty eligible staff nurses from each study unit were randomly selected to receive email invitations to participate. For study units with fewer than 30 eligible staff nurses, all eligible nurses were sent invitations. The total of 553 staff nurses were invited.

Heading level 2:

Study Variables and Measures

Heading level 3:

Nurse manager EBP competency. Nurse manager EBP competency was measured using the 16-item Nurse Manager EBP Competency Scale (NM-EBPC), which measures competency in two domains: (a) EBP Knowledge and (b) EBP Activity (Shuman, Ploutz-Snyder, et al., 2018). EBP knowledge refers to what nurse managers know about EBP, while EBP activity refers to what they do in relation to EBP. Nurse managers indicate their self-perceived level of competency for each item using a Likert scale from 0 to 3 (0 = *not competent*; 1 = *somewhat competent*; 2 = *fully competent*; and 3 = *expertly competent*). The NM-EBPC total score is calculated by summing scores on each item and dividing by 16. Subscale scores are calculated by summing scores of items within a respective subscale and dividing by the total number of subscale items. The NM-EBPC scale has previously demonstrated content validity and internal consistency reliability (Cronbach's α = .95 [total scale]; .90–.94 [subscales]; Shuman, Ploutz-Snyder, et al., 2018). Scale reliability for this study is described in Table 1.

Insert Table 1 about here

Heading level 3:

Nurse manager leadership behaviors for EBP implementation.
Leadership behaviors were measured using the 12-item Implementation
Leadership Scale (ILS), including both nurse managers' self-perceptions,
and staff nurses' perceptions of their nurse manager, regarding
leadership behaviors for EBP implementation in four domains: (a)
proactive leadership; (b) knowledgeable leadership; (c) supportive
leadership; and (d) perseverant leadership (Aarons, Ehrhart, & Farahnak,
2014). Respondents indicate their level of agreement with each item using
a Likert scale from 0 to 4 (0 = *not at all*; 4 = *very great extent*). Total
score is calculated by summing scores for each of the 12 items and
dividing by 12. Subscale scores are determined by adding the response
values for each item within a subscale and dividing by the number of
subscale items. In mental health settings, the ILS has demonstrated
convergent (r = 0.62–0.75) and discriminant (r = 0.050–0.406) validity,
as well as reliability (Cronbach's α = .98 [total scale]; .95–.96
[subscales]; Aarons, Ehrhart, & Farahnak, 2014). Reliability for the
present study is described in Table 2.

Insert Table 2 about here

Heading level 3:

Unit climate for EBP implementation. Unit climate was measured
using the 18-item Implementation Climate Scale (ICS), which measures the
extent to which employees perceive their unit to support EBP
implementation in six domains: (a) the unit's focus on EBP; (b)
educational support available for EBP; (c) recognizing staff for using
EBP; (d) rewarding staff for using EBP; (e) hiring staff who value or use
EBP; and (f) hiring staff open to innovation (Ehrhart, Aarons, &
Farahnak, 2014). Respondents select their level of agreement with each
item using a Likert scale from 0 to 4 (0 = *not at all*; 1 = *slight extent*;
2 = *moderate extent*; 3 = *great extent*; to 4 = *very great extent*). The ICS
total score is calculated for each participant by summing scores across
items and dividing by 18. Subscale scores are calculated by adding

response values for subscale items then dividing by the number of subscale items. The ICS has demonstrated construct validity and reliability (Cronbach's α = .91 [total scale]; .81–.91 [subscales]); Ehrhart, Aarons, & Farahnak, 2014). Reliability for this study is reported in Table 3.

Insert Table 3 about here

Heading level 3:

Demographic data of participants. Demographic data were collected, including age, sex, race, shift, education level, years of experience as a registered nurse, years of experience as a nurse manager, and years of experience as a registered nurse or nurse manager in the current hospital and unit.

Heading level 3:

Hospital and unit characteristics. The following data were collected to describe the hospitals: size, ownership type, location, Magnet® designation, average daily hospital census, and average case mix index. Unit-level characteristics included 3-month averages of unit bed capacity, daily unit census, patient age, skill mix (% registered nurse to other), registered nurse hours per patient day, and clinical nurse specialist hours per week.

Heading level 2:

Study Procedures and Data Collection

Data collection was facilitated by site coordinators who were trained in data collection methods using a data collection manual tailored to each study site. Site coordinators helped to identify eligible study units, nurse managers, and staff nurses for random selection, and assisted with questionnaire distribution. Survey data were collected from nurse managers and staff nurses using electronic surveys via Qualtrics® (Qualtrics Software, 2015). Nurse managers and randomly selected staff nurses were sent an email inviting them to complete a questionnaire inclusive of the NM-EBPC (nurse manager only), ILS, ICS,

and demographic items. Email reminders and a lottery drawing for a $100 cash card encouraged response. We describe study procedures and data collection methods in more detail elsewhere (Shuman, 2017; Shuman, Ploutz-Snyder, et al., 2018; see also Figure S2).

Heading level 2:

Statistical Analysis

Data were analyzed in R version 3.1.2 (R Core Team, 2016). Missing values were explored to identify patterns. If respondents completed less than 50% of a scale (NM-EBPC, ILS, or ILS), their responses for that scale were not used. Scale reliability among nurse managers' and staff nurses' responses was evaluated using Cronbach's ?. Descriptive statistics (mean and standard deviation) were calculated for each item, subscale, and total scale on the NM-EBPC, the ILS, and the ICS. The ILS and the ICS subscale and total scores were calculated separately for nurse managers and staff nurses, and independent t-tests with Bonferroni correction were used to test for significant differences between nurse manager and staff nurse scores. Significance was set at ? <.05.

Heading level 1:

Results

Heading level 2:

Hospital and Unit Characteristics

The sample included three small hospitals (<100 beds), two medium hospitals (100-300 beds), and two large hospitals (>300 beds). Units varied in bed size (range 9-45 beds) and primarily cared for older adult patients (>60 years of age). Hospital and unit characteristics are further described in Table 4.

Insert Table 4 about here

Heading level 2:

Participants

Response rates were 95.8% for nurse managers (*n* = 23) and 51.9% for staff nurses (*n* = 287). Demographic characteristics of nurse managers and staff nurses are described in Table 5. The majority of nurse managers and staff nurses were Caucasian and female. Most nurse managers had a bachelor's (52.2%) or master's degree (30.4%), while the majority of staff nurses held a bachelor's (59.2%) or associate's degree (28.9%).

Insert Table 5 about here

Heading level 2:

Nurse Manager EBP Competencies

The NM-EBPC (0–3 range) was completed by 22 nurse managers. In this study, the scale demonstrated high reliability for both subscales (Cronbach's α = .88 for EBP Knowledge and *a* = .87 for EBP Activity) and overall (*a* = .93). Scale reliabilities and means and standard deviations for each item, subscale, and total scale are summarized in Table 1. The mean NM-EBPC total score was 1.62 (*SD* = 0.50). The mean EBP Knowledge subscale score (1.77; *SD* = 0.55) was slightly higher than the mean EBP Activity subscale score (1.53; *SD* = 0.49).

Heading level 2:

Nurse Manager EBP Leadership Behaviors

The ILS (0–4 range) was completed by 284 staff nurses and 23 nurse managers. In this study, the scale reliability was high among staff nurses (total, α = .97; subscales, α = .89–.91) and among nurse managers (α = .84). The subscale reliability for nurse managers was low (α = .54) to acceptable (α = .70; see Table 2). The mean total ILS score (0–4 range) for staff nurses was 2.88 (*SD* = 0.78) and for nurse managers was

2.73 (*SD* = 0.46). For the four subscales, Proactive Leadership had the lowest mean score among both staff nurses (2.67 [*SD* = 0.87]) and nurse managers (2.25 [*SD* = 0.70]), respondents tended to score nurse managers higher for Supportive Leadership (staff nurses: *M* = 3.03 [*SD* = 0.80]; nurse managers: *M* = 3.23 (0.54)]. Subscale scores of Proactive and Knowledgeable leadership were significantly different (*p* < .05) for staff nurses and nurse managers, with staff nurses scoring nurse managers higher on average for both subscales than nurse managers scored themselves.

Heading level 2:

Unit Climate for EBP Implementation

Two hundred seventy-two staff nurses completed more than 50% of the ICS (0–4 range), while 22 nurse managers completed the ICS with no missing items. Reliability of the ICS was excellent in this study, with Cronbach's alphas of .94 and .92 among staff nurses and nurse managers, respectively. Subscale reliabilities were also good, with Cronbach's alphas of .72 or higher among both groups (see Table 2). The ICS total score (0–4 range) for staff nurses was 2.24 (*SD* = 0.74) and for nurse managers was 2.16 (*SD* = 0.67). The Focus subscale on EBP demonstrated the highest mean score of the staff nurse sample (2.66 [*SD* = 0.85]), whereas Hire for Openness was the highest scored subscale of the nurse manager sample (*M* = 2.72 [*SD* = 0.68]). Both staff nurses and nurse managers scored Rewards for EBP the lowest (staff nurses: *M* = 1.4 [*SD* = 0.96]; nurse managers: *M* = 1.04 [*SD* = 0.99]). No significant differences between staff nurses' and nurse managers' perceptions were observed.

Heading level 1:

Discussion

As the first examination of nurse manager EBP competencies, nurse manager leadership behaviors supporting EBP, and unit climates for EBP implementation in acute care, this study shows these instruments perform well psychometrically and support their use in implementation research. The reliabilities of all three scales and most of their subscales were

greater than .70. Three of the four ILS subscales did not demonstrate acceptable reliability among nurse managers, including subscales for Proactive, Supportive, and Perseverant leadership, which may be due to the small sample size of nurse managers (*n* = 23). Future research should further test the reliability of the ILS subscales among nurse managers using a larger sample.

The results identify significant opportunities for improvements in the EBP competencies and leadership behaviors of nurse managers. Nurse managers perceived that they were somewhat but not fully competent in EBP knowledge and activities as total scores were less than 2 (fully competent) on average. Although some competency items, notably "able to define EBP," "able to use evidence to inform clinical decision making," "able to assist in implementing EBP changes," and "able to access clinical practice guidelines on various clinical topics," were scored positively by most respondents, significant deficiencies (less than 50% of sample rating the item as "fully competent" or "expertly competent") were observed in almost half of the competencies. Managerial competencies recognized by professional groups, such as the American Organization of Nurse Executives (2015), should include EBP competencies and leadership. Improving nurse managerial EBP competency may likely contribute to improved EBP leadership and unit implementation efforts, which ultimately improves patient care and outcomes.

Most nurse manager leadership behaviors were reported as moderate, with proactive leadership behaviors receiving the lowest scores by both staff nurses and nurse managers. Only 30% to 43.5% of nurse managers rated items in this domain positively ("great extent" or "very great extent"). This is concerning because leadership support is critical for promoting use of EBPs and is expressed verbally, and by providing necessary resources, materials, and time to fulfill responsibilities (Everett & Sitterding, 2011; French et al., 2009; Sandström et al., 2011; Stetler, Ritchie, Rycroft-Malone, Schultz, & Charns, 2009). Numerous administrative responsibilities may deter nurse managers from proactive behaviors, such as establishing unit standards for EBP or developing a plan for EBP implementation (Wilkinson, Nutley, & Davies, 2011). Interestingly, staff nurses perceived their managers to be more proactive and knowledgeable regarding EBP than managers perceived themselves.

Aarons, Ehrhart, Torres, Finn, & Beidas (2017) observed similar divergent perspectives and contend that some leaders rate themselves lower out of humility. Furthermore, staff consider nurse managers to be clinical and managerial experts (knowledgeable leadership) who maintain and evaluate unit standards (proactive leadership; Baxter & Warshawsky, 2014; Duffield, Roche, Blay, & Stasa, 2011).

      Implementation climate total scores suggest that the practice climates for implementation of EBPs are less than optimal. Subscale scores indicate that practice climates rewarding EBP are relatively unsupported and that the units had climates only moderately prepared with EBP educational support, hiring staff who value EBP, and recognizing staff for EBP. This is concerning because rewards, provision of educational support, and selection of new staff are all key indicators of whether practice climates are conducive to EBP implementation (Aarons, Ehrhart, Farahnak, & Sklar, 2014). Since nurse managers are instrumental in creating and maintaining unit climates supportive of EBP implementation, development and testing of an intervention targeting nurse managers' competencies, leadership behaviors, and creation of practice climates for implementation of EBPs are warranted.

Heading level 1:

Implications for Clinical Practice

      Findings from this study have relevance for practice. First, when planning for implementation of an EBP in a specific practice setting, consideration should be given to assessing the nurse manager leadership behaviors and implementation climate. The results from the assessment can guide selection of implementation strategies that may otherwise be overlooked. For example, if scores for recognition and reward from the ICS are low to moderate, the implementation plan should include how staff will be recognized and rewarded for their work in implementing the EBP. Recognition can be achieved through organizational publications such as newsletters, personnel thank you notes from the nurse manager, highlighting the work at system level quality improvement meetings, and nominating individuals or teams for practice excellence awards offered by the health system or professional organizations. Rewards may be offered

to an individual or team who has been instrumental in implementing the EBP through receipt of financial support to attend a regional or national conference to present their work.

Second, findings suggest that these three key context factors that impact implementation should be routinely assessed to build strong organizational capacity for adoption of EBPs. Results of the assessment should be examined for opportunities to strengthen organizational capacity for EBP and guide organizational interventions and programs to address these areas of opportunity. For example, if scores for hiring staff that value EBP are low (as rated by the majority of this study's sample), an organization may want to examine hiring practices and interview questions used in selection of staff. Additionally, considerable work is needed to improve staff perceptions of rewards allocated for EBP use by staff. This may be accomplished by including EBP criteria in staff evaluations (an EBP competency of nurse managers) for promotion and raises (markers of a strong EBP climate).

Third, because nurse managers of practice sites (e.g., ambulatory care clinic, patient care unit) where EBPs will be implemented are key to success (Birken et al., 2016; Wilkinson et al., 2011), organizations should provide didactic and experiential learning for nurse managers to achieve EBP competencies and leadership for EBP. Training should be targeted to areas requiring improvement. Future research is needed to develop these training programs.

Heading level 1:

Limitations

This study has some limitations. A convenience sample of hospitals was used for the study, which may affect generalizability, although different-sized hospitals with varied characteristics were recruited from diverse regions to minimize this limitation. Also, since only adult medical-surgical units were included, the results from this study may have limited generalizability to other types of nursing units (e.g., intensive care, pediatric, ambulatory care, long-term care). We recognize the importance of replicating this study in other types of patient care units and settings. Although the ILS total score reliability among nurse

managers was good, subscale reliabilities were low and should be interpreted cautiously.

Heading level 1:

Conclusions

The results of this study provide evidence supporting the reliability of using these scales in hospital settings with staff nurses and nurse managers. EBP leadership behaviors and competencies of nurse managers and climates supportive of EBP in hospital settings were modest at best. Therefore, investigators studying implementation should incorporate these three dynamic context factors into their research. We are unlikely to close the critical gap between research and practice if studies do not examine the interplay between dynamic context factors and the implementation strategies used to promote uptake of EBPs. For practice, critical attention is needed to build organizational capacity for EBPs through development of unit leadership and climates for EBP to accelerate routine use of EBPs for improving care delivery and patient outcomes.

Please gray-box Clinical Resources

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Clinical Resources

- American Organization of Nurse Executives. http://www.aone.org/
- National Nursing Practice Network. http://www.nnpnetwork.org/

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Table 1. Nurse Manager EBP Competency Scale: Reliabilities and Scores (N = 22)

I am able to . . .	α	M	SD	Rating 2–3 (%)
Subscale 1: EBP Knowledge	.88	1.77	0.55	
define EBP.		2.00	0.62	81.8
locate primary evidence in bibliographic databases using search terms.		1.68	0.78	59.1
differentiate among primary evidence, systematic reviews, and evidence-based guidelines.		1.41	0.67	40.9
recognize ratings of strength of evidence when reading systematic reviews and evidence summary reports.		1.27	0.83	40.9
identify key criteria in well-developed evidence summary reports using existing critical appraisal checklists.		1.41	0.59	45.5
critically appraise original research reports for practical implications.		1.32	0.72	36.4
Subscale 2: EBP Activity	.87	1.53	0.49	
ensure that the delivery of care on my unit(s) aligns with EBP recommendations.		1.82	0.73	63.6
evaluate processes and outcomes of EBP changes.		1.82	0.73	63.6
use evidence to inform clinical decision-making.		1.91	0.68	72.7
use criteria about EBP in screening and hiring staff.		1.09	0.87	31.8
participate on a team to develop EBP recommendations for my unit(s) and/or organization.		1.86	0.71	68.2
assist in implementing EBP changes in my unit(s) or organization.		2.00	0.62	81.8
participate in resolving issues related to implementing EBP.		1.77	0.69	63.6
use audit and feedback of data as an implementation strategy for EBP knowledge and use.		1.36	0.73	40.9
use criteria about EBP in performance evaluation of staff.		1.32	0.72	45.5
access clinical practice guidelines on various clinical topics.		1.86	0.64	72.7
Total scale	.93	1.62	0.50	

Note. Scale range is 0–3 (0 = not competent; 1 = somewhat competent; 2 = fully competent; 3 = expertly competent). EBP = evidence-based practice.

Table 2. Implementation Leadership Scale: Reliabilities and Scores by Role (n = 284 staff RNs; n = 23 nurse managers)

"I am/have . . ." (nurse manager version) / "My nurse manager is/has . . ." (staff RN version)	Reliability		Mean Score by Role						RN Compared to NM	
	RN	NM	RN				NM			
									Rating 3–4	
					Rating 3–4					
	α	α	M	SD	(%)		M	SD	(%)	t^a	p^b
Subscale 1: Proactive Leadership	.90	.65	2.67	0.87			2.25	0.70		2.75	.01
established clear standards for implementation of EBP.			2.80	0.91	64.8		2.22	1.13	39.1		
..developed a plan to facilitate EBP implementation.			2.68	0.97	59.5		2.22	0.85	30.4		
removed obstacles to implementation of EBP.			2.54	0.95	53.5		2.30	0.70	43.5		
Subscale 2: Knowledgeable Leadership	.91	.70	2.99	0.80			2.54	0.53		3.80	<.001
knows what he/she is talking about when it comes to EBP.			2.98	0.91	74.6		2.48	0.67	60.9		
is knowledgeable about EBP.			3.12	0.77		81.3	2.74	0.62	65.2		
is able to answer staff questions about EBP.			2.89	0.92	72.9		2.39	0.72	43.5		
Subscale 3: Supportive Leadership	.89	.54	3.03	0.80			3.23	0.54		-1.66	.11
recognizes and appreciates employee efforts toward successful implementation of EBP.			3.02	0.85	77.5		2.83	0.98	73.9		
supports employee efforts to learn more about EBP.			2.98	0.95	72.9		3.48	0.51	100		
supports employee efforts to use EBP.			3.09	0.86	79.6		3.39	0.66	91.3		
Subscale 4: Perseverant Leadership	.91	.57	2.84	0.84			2.88	0.50		-0.39	.70

	α	ω	M	SD	%	M	SD	%	t	p
reacts to critical issues regarding the implementation of EBP by openly and effectively addressing the problem(s).			2.88	0.91	70.4	3.00	0.80	78.3		
carries on through the challenges of implementing EBP.			2.83	0.90	69.7	2.87	0.63	73.9		
perseveres through the ups and downs of implementing EBP.			2.81	0.93	67.3	2.78	0.60	69.6		
Total scale	.97	.84	2.88	0.78		2.73	0.46		1.49	.15

Note. Scale range is 0–4 (0 = not at all; 1 = slight extent; 2 = moderate extent; 3 = great extent; 4 = very great extent). EBP = evidence-based practice NM = nurse manager; RN = registered nurse.
[a]Independent t-test.
[b]Bonferroni corrected.

Table 3. Implementation Climate Scale: Reliabilities and Scores by Role (n = 272 staff RNs; n = 22 nurse managers)

	Reliability		Score by role						RN compared to NM	
	RN	NM	RN			NM				
					Rating 3–4			Rating 3–4		
	α	α	M	SD	(%)	M	SD	(%)	t[1]	p[2]
Subscale 1: Focus on EBP	.89	.83	2.66	0.85		2.67	0.80		-0.03	.97
Using EBPs is a top priority in my unit.			2.66	0.97	59.9	2.78	0.80	56.5		
People in my unit think that the implementation of EBP is important.			2.64	0.87	61.8	2.70	0.93	65.2		
One of my unit's main goals is to use EBP effectively.			2.68	0.97	60.3	2.52	1.04	47.8		
Subscale 2: Educational Support for EBP	.82	.75	2.26	0.93		2.23	0.89		0.16	.87
My unit provides EBP trainings or in-services.			2.28	1.02	40.1	2.00	1.35	39.1		
My unit provides opportunities to attend conferences, workshops, or seminars focusing on EBP.			2.38	1.14	48.5	2.43	0.95	47.8		
My unit provides EBP training materials, journals, etc.			2.14	1.08	37.1	2.26	0.92	39.1		
Subscale 3: Recognition for EBP	.77	.75	2.38	0.83		2.25	0.82		0.75	.46
Clinicians who use EBPs are held in high esteem in my unit.			2.77	0.86	65.4	2.48	0.95	52.2		
Clinicians in my unit who use EBPs are seen as clinical experts.			2.51	0.98	53.3	2.61	1.03	65.2		
Clinicians in my unit who use EBPs are more likely to be promoted.			1.86	1.17	30.1	1.65	1.03	26.1		
Subscale 4: Rewards for EBP	.73	.72	1.40	0.96		1.04	0.99		1.69	.10
My unit provides the ability to accumulate compensated time for the use of EBPs.			1.86	1.18	29.8	1.39	1.20	17.4		

			M	SD	%	M	SD	%	t^1	p^2
My unit provides financial incentives for the use of EBPs.			1.06	1.21	14.0	0.91	1.47	21.7		
The better you are at using EBPs, the more likely you are to get a raise.			1.31	1.17	16.5	0.83	0.98	8.7		
Subscale 5: Selection for EBP	.87	.84	2.25	0.94		2.03	0.85		1.17	.25
My unit hires staff who value EBP.			2.35	1.01	46.0	2.30	0.97	43.5		
My unit hires staff who have had formal education supporting EBP.			2.19	1.14	42.6	1.91	0.95	26.1		
My unit hires staff who have previously used EBPs.			2.19	0.99	39.3	1.87	1.01	34.8		
Subscale 6: Selection for Openness	.87	.87	2.49	0.80		2.72	0.68		-1.59	.12
My unit hires staff who are flexible.			2.51	0.89	50.7	2.91	0.67	82.6		
My unit hires staff who are adaptable.			2.58	0.86	55.9	2.78	0.85	69.6		
My unit hires staff open to new types of interventions.			2.37	0.92	46.7	2.48	0.90	52.2		
Total scale	.94	.92	2.24	0.74		2.16	0.67		0.57	.58

[1]Independent t-test.

[2]Bonferroni corrected.

Note. Scale range is 0–4 (0 = not at all; 1 = slight extent; 2 = moderate extent; 3 = great extent; 4 = very great extent). EBP = evidence-based practice; NM = nurse manager; RN = registered nurse.

Table 4. Hospital and Unit Characteristics

Hospital characteristics (N = 7)	M	SD	n	%
Hospital size[a]				
Small (<100 beds)			3	42.8
Medium (100–300 beds)			2	28.6
Large (>300 beds)			2	28.6

Hospital type (can be 1 or more)			
Private/not for profit		6	85.7
Private/for profit		1	14.3
Church affiliated		4	57.1
Urban		3	42.8
Rural		4	57.1
Magnet designation			
Current		2	28.6
Expired/no designation		5	71.4
Average daily hospital census[a]	132.49	138.44	
Average case mix index[a]	1.41	0.40	

Table 5. Respondent Demographics by Role

Unit characteristics (N = 24)

	M	SD	n	%
Unit bed capacity[b]	24.99	9.52		
Average daily unit census[b]	17.73	9.54		
Average patient age[b]	63.99	5.24		
Average skill mix[b] (% RN to other)	60.00	10.00		
Average RN HPPD[b]	7.31	1.49		
Clinical nurse specialist				
None (0 hr)			9	37.5
Part time (1–39 hr)			10	41.7
Full time (40 hr)			5	20.8

Note: HPPD = hours per patient day; RN = registered nurse.

[a]Data collected over 6 months.

[b]Data collected over 3 months.

	Nurse manager (n = 23)				Staff nurse (n = 287)			
	M	SD	n	%	M	SD	n	%
Sex								
Female			20	87			24	84.
Male			2	.0			1	0

	Nurse manager (n = 23)				Staff nurse (n = 287)			
	M	SD	n	%	M	SD	n	%
Missing			1	8.			13	4.5
				7			33	11.
				4.				5
				3				
Race								
Caucasian				82				
Other				.6				83.
Missing				8.			24	6
			19	6			0	5.4
			2	12			16	11.
			2	.9			31	0
Education								
Diploma								
Associate's				13				2.4
Bachelor's				52			7	28.
Master's				.2			83	9
Missing			3	30			17	59.
			12	.4			0	2
			7	8.			7	2.4
			1	6			20	7.0
Shift								
Days								35.
Evenings								6
Nights							10	4.5
Rotate							2	24.
Missing							13	4
							70	28.
							83	9
							19	6.6
Age (years)	41.7	6.6			34.	11.9		
	6	7			9	4		
Years as RN	15.6	6.0			7.8			
	4	6			4	9.88		
Years as NM	3.91	2.5						

	Nurse manager (n = 23)				Staff nurse (n = 287)			
	M	SD	n	%	M	SD	n	%
		6						
Years in role in current hospital	3.95	2.61			5.58	7.90		
Years in role in current unit	3.05	2.46			4.89	7.23		

Note: NM = nurse manager; RN = registered nurse.